Remarks

Claims 1 and 3-9 are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over either Bonsignore et al. (6,432,320, the "'320 patent") or Bonsignore et al. (2004/0069454, the "'454 reference").

Claims 1-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bittner et al. (WO 02/31222 A2, the "'222 reference").

Claim 1 has been amended, and new claims 38-46 have been added. Claims 38-46 are explicitly supported by the specification of the present application as originally filed in, for example, ¶¶ 0003, 0019, and 0041-0043. The limitation added to claim 1 is supported by, for example, U.S. Pat. No. 5,476,580 (Thorn et al.) at col. 7, l. 20 to col. 8, l. 7, which is incorporated into the present application by reference in its entirety. (¶ 0004). Therefore, no new matter has been added by the amendment and the new claims.

35 U.S.C. § 102 (Novelty)

Applicants respectfully submit that claim 1 is novel over the '320 patent and the '454 reference, because the composition of claim 1 differs from the compositions disclosed in the '320 patent and the '454 reference.

Claim 1 of the present application defines a composition comprising [1] from about 0.1 to about 25% by weight of graphite; [2] from about 0.01 to about 10% by weight of a water dispersible binding agent for binding to said graphite, wherein said water dispersible binding agent is selected from the group consisting of monosaccharides, polysaccharides, and combinations thereof; and [3] a corrosion inhibitor, wherein said corrosion inhibitor is [4] present in an amount effective to reduce the dissolution of metal from the metallic surface in

contact with said composition, wherein [5] said graphite and corrosion inhibitor are dispersed in water.

The '320 patent "relates to additives for heat transfer media and refrigerants, and in particular to the use of stabilized nano-particle size metal powders to enhance the thermal capacity and thermal conductivity of refrigerant and heat transfer media." (Col. 1, ll. 9-13). The heat transfer composition disclosed in the '320 patent is totally different from the composition of claim 1 at least because the '320 patent (1) does not teach a composition comprising both graphite and a corrosion inhibitor; (2) does not teach a composition comprising a water dispersible agent selected from the group consisting of monosaccharides, polysaccharides, and combinations thereof for binding to the graphite; and (3) does not teach that the corrosion inhibitor, when used, shall be present in an amount effective to reduce the dissolution of metal from the metallic surface in contact with said composition.

The '320 patent teaches a composition containing a powder (which may be a metal powder or a carbon-containing powder) coated with a corrosion inhibitor or a dispersant. (Col. 2, ll. 5-9). When the powder is a metal powder, the '320 patent teaches that the powder particles may be coated with a corrosion inhibitor. (Col. 4, ll. 40-49; claim 1). However, the '320 patent does not disclose a composition comprising both graphite and a corrosion inhibitor. Instead, the '320 patent discloses that when the powder is a carbon-containing powder such as graphite, the chemical agent should be a dispersant rather than a corrosion inhibitor. (Col. 5, ll. 43-55). The '320 patent states that "[f]or carbon containing powders such as graphite . . . suitable chemical agents include lignin and its derivatives." (Col. 5, ll. 43-45). The '320 patent lists lignin and some other chemical agents that can be used to treat carbon-based powders, but they are all dispersants, and none of them is a corrosion inhibitor. (Col. 5, l. 56 to col. 6, l. 17; claim 17). Thus, the '320 patent does not teach a composition comprising both graphite and a corrosion inhibitor.

Further, claim 1 of the present application requires that the composition contains a water dispersible biding agent selected from the group consisting of monosaccharides, polysaccharides, and combinations thereof for binding to the graphite. U.S. Pat. No. 5,476,580, which is incorporated into the present application by reference, teaches that the binding agent is believed to assist the dispersed graphite in adhering to the surface of the non-conductive substrate (col. 7, lines 23-25). None of the chemical agents for treating graphite particles disclosed in the '320 patent is a monosaccharide or polysaccharide binding agent (*See* col. 5, l. 43 to col. 6, l. 17). Therefore, the composition of claim 1 differs from any composition disclosed in the '320 patent.

Moreover, claim 1 requires that the corrosion inhibitor shall be present in an amount effective to reduce the dissolution of metal from a metallic surface in contact with the composition of claim 1. The metallic surface here is not part of the composition. In the '320 patent, the corrosion inhibitor is used either to treat the metal powder particles which are part of the heat transfer composition and form a film on the particles or to reduce the interfacial tension between the treated metal powders. (Col. 5, lines 24-25; col. 6, lines 35-49; col. 7, lines 32-37). The '320 patent does not teach or suggest, however, that its heat transfer composition will be in contact with a metallic surface and that the amount of the corrosion inhibitor dispersed in it shall be effective to reduce the dissolution of metal from this metallic surface.

At least for the reasons discussed above, the composition of claim 1 differs from any composition disclosed in the '320 patent, and claim 1 is therefore novel over the '320 patent. Claims 3-9 are dependent on claim 1 and add further limitations. Claims 3-9 are therefore also novel over the '320 patent.

The '454 reference is a continuation-in-part of the '320 patent, which is identical in the relevant part to the '320 patent and does not change the fundamental difference between the compositions of the present application and that of the '320 patent. Therefore, claims 1 and 3-9 are novel over the '454 reference at least for the same reasons as discussed above with respect to the '320 patent.

The new independent claim 38 defines a composition that also contains both graphite and a corrosion inhibitor dispersed in water. Therefore, claim 38 and its dependent claims 39-46 are novel over the '320 patent and the '454 reference at least for this same reason as for claim 1. Further, claim 38 requires that its composition shall contain metal dissolved by the alkaline etching agent into the composition. Neither the '320 patent nor the '454 reference teaches such a composition. Moreover, claim 38 requires that the corrosion inhibitor shall be present in an amount effective to prevent gel formation or at least partially reverse gel formation caused by the dissolved metal in said composition. The '320 patent and the '454 reference do not teach this limitation either. Therefore, claims 38 and its dependent claims (39-46) are novel over the '320 patent and the '454 reference at least for these additional reasons.

35 U.S.C. § 103 (Non-obviousness)

In order for a *prima facie* case of obviousness to be established, the *Manual of Patent Examining Procedure* ("*MPEP*") states:

> First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine the teaching. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art.

MPEP § 2142, page 2100-134 (Ed. 8 Rev. 3, August 2005). To render a claim obvious, even if there is only one reference involved, there must be a showing of a suggestion or motivation to modify the teachings of that reference to the claimed invention in order to support the obviousness conclusion. Additionally, if a prima facie case of obviousness is not established, Applicants are under no obligation to submit evidence of nonobviousness. *MPEP* at 2100-133 ("The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness.").

The Examiner rejected claims 1 and 3-9 alternatively under 35 U.S.C. § 103(a) as being unpatentable over the '320 patent or the '454 reference. The Examiner also rejected claims 1-9 under 35 U.S.C. § 103(a) as being unpatentable over the '222 reference. The Applicants respectfully submit that no *prima facie* case of obviousness here exists, because the prior art references cited do not teach or suggest all the claim limitations and contain no suggestion or motivation that they should be modified as suggested by the Examiner to arrive a composition as claimed by the present application.

As discussed above, the '320 patent does not teach a composition comprising both graphite and a corrosion inhibitor dispersed in water. Instead, the '320 patent teaches away from such a composition. The '320 patent states that "[f]or carbon containing powders such as graphite . . . suitable chemical agents include lignin and its derivatives . . . [which] tends to act as a dispersant." (Col. 5, ll. 43-54). The '320 patent further teaches that carbon-based powders should be coated with a dispersant additive "rather than [] a corrosion inhibitor/passivation agent." (Col. 5, ll. 53-55). Thus, the '320 patent in fact explicitly teaches away from a composition comprising both graphite and a corrosion inhibitor. Therefore, there is no motivation or suggestion in the '320 patent that its composition should be modified to recreate the composition of claim 1 in the present application.

"A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." *MPEP*, § 2141.02, at 2100-132. As discussed above, when considered as a whole, the '320 patent teaches away from Applicants' composition. Applicants respectfully submit that picking and choosing graphite from one composition containing carbon-based particles and the corrosion inhibitor from another composition containing metal powder particles from the '320 patent and then combining them together ignores the '320 patent in its entirety and is therefore improper. There simply is no suggestion or motivation in the '320 patent that it should be modified to arrive at the invention recited in claim 1 of the present application.

The '320 patent does not disclose any binding agent, either for the metal powder particles or the carbon-based powder particles, that can assist the dispersed particles in adhering to the surface of a substrate, much less a monosaccharide or polysaccharide binding agent. The compositions disclosed in the '320 patent are heat transfer compositions; the particles in the compositions are there to transfer heat, not to adhere to a substrate. There is no motivation or suggestion in the '320 patent that these composition should be modified to include a binding agent as claimed by the present application. In fact, modifying the composition of the '320 patent to make it contain a binder to adhere the particles to a substrate in contact with the composition will be against the purpose of composition, and therefore, there is no motivation or suggestion in the '320 patent to make this modification. *MPEP*, § 2143.01, at 2100-137. ("If [a] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.").

Further, as discussed above, the '320 patent does not teach or suggest that its heat transfer composition will be in contact with a metallic surface or that the amount of the corrosion inhibitor dispersed in it is effective to reduce the dissolution of metal from this metallic surface. Therefore, there is no motivation or suggestion in the '320 patent that its composition should be modified to contain a corrosion inhibitor in an amount as claimed by claim 1 of the present application.

Thus, at least for these reasons, Applicants respectfully submit that claim 1 and its dependent claims 3-9 of the present application are not obvious and are in condition for allowance over the '320 patent.

The '454 reference is a continuation-in-part of the '320 patent, which is identical in the relevant part to the '320 patent and does not change the deficiencies in the '320 patent. Therefore, claims 1 and 3-9 are not obvious and are in condition for allowance over the '454 reference at least for the same reasons as discussed above with respect to the '320 patent.

The new independent claim 38 defines a composition that also contains both graphite and a corrosion inhibitor dispersed in water. Further, claim 38 requires that its composition shall contain metal dissolved by the alkaline etching agent into the composition. Moreover, claim 38 requires that the corrosion inhibitor be present in an amount effective to prevent gel formation or at least partially reverse gel formation in the composition. The '320 patent and the '454 reference do not teach any of these limitations. In order to arrive a composition as claimed by claim 38, the heat transfer composition taught by the '320 patent or the '454 reference needs to be modified to (1) include both graphite and a corrosion inhibitor in the same composition dispersed in water; (2) include metal dissolved by an alkaline etching agent into the composition; and (3) contain the corrosion inhibitor in amount effective to prevent gel formation or at least partially reverse gel formation caused by the dissolved metal in the composition. There is no motivation or suggestion in the '320 patent or the '454 reference to do any of these modifications, much less to do all of them together. Therefore, claims 38 and its dependent claims 39-46 are patentable over the '320 patent and the '454 reference.

Claims 1-9 are also rejected under 35 U.S.C. § 103(a) over the '222 reference (the Examiner used U.S. 2004/0054044 as the English translation of the '222 reference). Applicants respectfully traverse this rejection.

The '222 reference relates to a composition for coating a metallic surface containing the following in addition to water: a) at least one organic film former; a quantity of cations and/or hexafluoro complexes of cations selected from the group comprising titanium, zirconium, hafnium, silicon, aluminium and boron; and (c) at least one inorganic compound in particle form. (Abstract). The '222 reference teaches that the clean metallic surface is brought into contact with the aqueous composition and an organic film containing particles is formed on the metallic surface. (*Id.*)

Claim 1 has been amended to require that the composition contain from about 0.01 to about 10% by weight of a water dispersible binding agent for binding to graphite. The water dispersible binding agent is selected from monosaccharides, polysaccharides, and combinations

thereof. The '222 reference cannot render claim 1 obvious because it does not teach a composition containing both graphite and a corrosion inhibitor, where the corrosion inhibitor is present in an amount effective to reduce the dissolution of metal from the metallic surface in contact with the composition; and it does not teach or suggest a binding agent selected from the group consisting of monosaccharides, polysaccharides, and combinations thereof.

Claim 1 adds a limitation requiring that the composition contain a water dispersible biding agent selected from monosaccharides, polysaccharides, and combinations for binding to the graphite. This limitation is completely missing in the '222 reference. The aqueous composition taught by the '222 reference is for coating a metallic surface with an organic polymer film containing particles from the aqueous composition and protect the metallic surface from corrosion by the polymer film. (*See* Abstract; ¶¶ 0001 and 0033). The '222 reference does not teach or suggest a water dispersible binding agent as claimed by the present application, which is different from any of the organic film formers disclosed in the '222 reference. Neither does the '222 reference provide any motivation or suggestion to modify its composition by using a monosaccharide or polysaccharide binding agent.

Regarding corrosion inhibitors, the '222 reference teaches that the aqueous composition of its invention can optionally contain at least one corrosion inhibitor, which is included in the coating formed from the composition on the metallic surface to help achieve the required reliability for corrosion resistance in mass production. (¶0033). As taught by the '222 reference, the purpose of the corrosion inhibitor in its composition is to be included in the polymer film coated on the metallic surface to help improve the corrosion resistance of the metallic surface (¶¶ 0033 and 0181), but not to reduce the dissolution of metal from the metallic surface in contact with the composition. Therefore, the '222 reference does not teach or suggest that the corrosion inhibitor should be included in an amount effective to reduce the dissolution of metal from the metallic surface in contact with the composition.

Regarding graphite or/and carbon black, the '222 reference mentions them in a long list of compounds that can be added as the inorganic compound in particle form to the aqueous

composition. Such compounds include: carbonates, oxides, silicates or sulfates of, for example, aluminium, barium, cerium, calcium, lanthanum, silicon, titanium, yttrium, zinc or/and zirconium, such as particles based upon aluminium oxide, barium sulfate, cerium dioxide, rare-earth mixed oxide, silicon dioxide, silicate, titanium oxide, yttrium oxide, zinc oxide or/and zirconium oxide; phosphates, phosphides or sulfides of aluminium, iron or molybdenum, such as aluminium phosphide, iron oxide, iron phosphide, molybdenum sulfide; and graphite or/and carbon black. (¶¶ 0075-76). The '222 reference does not provide any composition in its examples that actually contains graphite and/or carbon black, much less a composition containing both graphite and a corrosion inhibitor as required by claim 1 of the present application. Applicants respectfully submit that isolating graphite out of the large number of inorganic compounds in particle form disclosed in the '222 reference and attempting to shoehorn into it Applicant's composition is improper and constitutes impermissible picking and choosing. There simply is no suggestion in the '222 reference to pick both graphite and a corrosion inhibitor and combine them in the same composition as recited in claim 1 of the present application.

Therefore, at least for the reasons discussed above, claim 1 is nonobvious and patentable over the '222 reference.

The new independent claim 38 defines a composition that contains both graphite and a corrosion inhibitor dispersed in water. Further, claim 38 requires that its composition contain metal dissolved by the alkaline etching agent into the composition that may cause gel formation. Moreover, claim 38 requires that the corrosion inhibitor be present in an amount effective to prevent gel formation or at least partially reverse gel formation caused by the dissolved metal in the composition. The '222 reference does not teach any of these limitations. As discussed above, it takes picking and choosing in the '222 reference based on hindsight to arrive a composition containing both graphite and an corrosion inhibitor as claimed by claim 38 of the present application. The aqueous composition of the '222 reference is for coating a metallic surface with an organic polymer film containing particles from the aqueous composition and

protect the metallic from corrosion by the polymer film. (*See* Abstract; ¶¶ 0001 and 0033). To dissolve metal into the composition by an etching agent will be against the purpose of the '222 reference. In fact, the '222 reference teaches, "The aqueous composition is particularly preferably free or largely free from lead, cadmium, iron, cobalt, copper, manganese, nickel, zinc or/and tin." (¶ 26). In order to arrive a composition as claimed by claim 38, the aqueous composition of the '222 reference needs to be modified to (1) include both graphite and a corrosion inhibitor in the same composition dispersed in water; (2) include metal dissolved by an alkaline etching agent into the composition that may cause gel formation; and (3) contain the corrosion inhibitor in an amount effective to prevent gel formation or at least partially reverse gel formation caused by the dissolved metal in the composition. There is no motivation or suggestion in the '222 reference to do any of these modifications, much less to do all of them together.

Therefore, the new claim 38 and its dependent claims 39-46 are patentable over the '222 reference.

Conclusion

In view of the above amendments and remarks, Applicants respectfully request reconsideration and allowance of all the pending claims (1-9 and 38-46). A Notice of Allowance is respectfully solicited.

The Commissioner is authorized to charge any required fees or credit overpayment to the deposit account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

Respectfully submitted,

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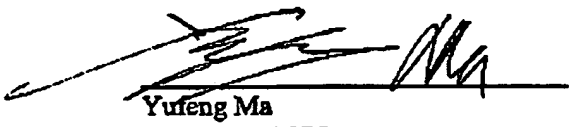

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